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February 26, 2019

AEP-NRC-2019-05
10 CFR 50.90

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Donald C. Cook Nuclear Plant, Unit 1 and Unit 2
License Amendment Request to Address Issues Identified in Westinghouse Document NSAL-15-1

Reference:

1. Westinghouse Nuclear Safety Advisory Letter, NSAL-15-1, Revision 0, "Heat Flux Hot Channel Factor Technical Specification Surveillance," February 3, 2015.

In accordance with the provisions of Section 50.90 of Title 10 of the Code of Federal Regulations (10 CFR), Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, is submitting a License Amendment Request for an amendment to Technical Specifications (TS) for CNP, Unit 1 and Unit 2. The proposed changes would revise the TS to address the issues identified in a Westinghouse communication document.

Specifically, the proposed changes will address the issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL) NSAL-15-1, Rev. 0 (Reference 1) by expanding criteria within TS 3.2.1 Surveillance Requirements which apply an appropriate penalty factor to measured transient $F_Q(Z)$. Recommendations from NSAL-15-1, Rev. 0 were administratively implemented at CNP in accordance with NRC Administrative Letter 98-10.

Enclosure 1 to this letter provides an affirmation statement. Enclosure 2 provides an evaluation of the proposed change. Enclosures 3 and 4 provide existing Unit 1 and Unit 2 TS pages, respectively, marked up to show the proposed changes. New clean Unit 1 and Unit 2 TS pages, with proposed changes incorporated, will be provided to the U. S. Nuclear Regulatory Commission (NRC) Licensing Project Manager when requested.

Enclosures 5 and 6 to this letter provide existing Unit 1 and Unit 2 TS Bases pages, respectively, marked up to show the proposed changes. TS Bases markups are included for information only. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the TS 5.5.12, "Technical Specifications Bases Control Program."

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Approval of the proposed amendment is requested in accordance with the normal NRC review schedule for such changes. Once approved, the amendment will be implemented within 90 days. Copies of this letter are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91. There are no new regulatory commitments made in this letter. Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Director, at (269) 466-2649.

Sincerely,

Q. Shane Lies
Site Vice President

JMT/mll

Enclosures:

1. Affirmation
2. Evaluation of Proposed Changes
3. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Page Marked To Show Proposed Changes
4. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Page Marked To Show Proposed Changes
5. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)
6. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)

c: R. J. Ancona – MPSC
R. F. Kuntz, NRC Washington, D.C.
MDEQ – RMD/RPS
NRC Resident Inspector
D. J. Roberts, NRC Region III
A. J. Williamson – AEP Ft. Wayne, w/o enclosures

Enclosure 1 to AEP-NRC-2019-05

AFFIRMATION

I, Q. Shane Lies, being duly sworn, state that I am the Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the U. S. Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Q. Shane Lies
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 26 DAY OF February, 2019

Notary Public

My Commission Expires 01/21/2025

Enclosure 2 to AEP-NRC-2019-05
Evaluation of Proposed Changes

Subject: Request to modify Technical Specifications Section 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)," to address issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL) NSAL-15-1, Rev. 0 (Reference 1) by expanding criteria within TS 3.2.1 Surveillance Requirements which apply an appropriate penalty factor to measured transient $F_Q(Z)$.

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1.0 SUMMARY DESCRIPTION

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, proposes an amendment to Technical Specifications (TS) for CNP, Unit 1 and Unit 2.

The proposed amendment would modify TS Section 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)," to address issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL) NSAL-15-1, Rev. 0. (Reference 1) by defining TS surveillance requirements for transient $F_Q(Z)$ and corresponding actions with which to apply an appropriate penalty factor to measured results.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

Westinghouse letter, NSAL-15-1 (Reference 1), notified Westinghouse customers of an issue associated with Surveillance Requirement (SR) 3.2.1.2 in TS 3.2.1C of Westinghouse Standard Technical Specifications, NUREG-1431, Rev. 4 (Reference 2). CNP TS 3.2.1 follows the methodology for NUREG 1431, TS 3.2.1C. For certain trends in measured $F_Q(Z)$ and pre-calculated allowance factor W(Z), the existing TS SR may not ensure that the transient $F_Q(Z)$, $F_Q^W(Z)$, will meet the heat flux hot channel factor limit between the performance of the monthly flux map measurements, thus rendering the existing CNP TS 3.2.1 as non-conservative.

Westinghouse recommended that affected licensees administratively implement additional $F_Q^W(Z)$ surveillance actions such that the measured $F_Q^W(Z)$ will in all cases remain bounded by the $F_Q(Z)$ that is assumed in the licensing basis analyses. Specifically, the $F_Q^W(Z)$ penalty factor described in SR 3.2.1.2 NOTE 2 is applied in two additional instances: when measured $F_Q^C(Z)*W(Z)/K(Z)$ has increased from the previous surveillance or when measured $F_Q^C(Z)*W(Z)/K(Z)$ is expected to increase at the next surveillance. I&M has administratively implemented these actions as described in Reference 1 and in accordance with U. S. Nuclear Regulatory Commission (NRC) Administrative Letter 98-10 (Reference 3). I&M currently performs TS SR 3.2.1 using the established administrative controls to ensure that TS 3.2.1 is conservatively met.

I&M is proposing to change TS 3.2.1, Heat Flux Hot Channel Factor ($F_Q(Z)$), to incorporate the recommendations from Reference 1 for application of a penalty factor on the measured $F_Q^W(Z)$.

2.2 Current Technical Specifications Requirements

CNP's Unit 1 and Unit 2 SR 3.2.1.2 currently states:

	SURVEILLANCE	FREQUENCY
SR 3.2.1.2	----------NOTES---------- 1. Not required to be performed during power escalation at the beginning of each cycle until 24 hours after equilibrium conditions at a power level for extended operation are achieved. 2. If measurements indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) has increased since the previous evaluation of $F_Q^C(Z)$ either: a. Increase $F_Q^W(Z)$ by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits; or b. Repeat SR 3.2.1.2 once per 7 EFPD until either a. above is met or two successive flux maps indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) has not increased. ----------	
	Verify $F_Q^W(Z)$ is within limit.	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND In accordance with the Surveillance Frequency Control Program

2.3 Reason for the Proposed Change

In February of 2015, Westinghouse issued Nuclear Safety Advisory Letter NSAL-15-1, "Heat Flux Hot Channel Factor Technical Specification Surveillance." This NSAL stated that one aspect of TS SR 3.2.1.2 of TS 3.2.1B, "Heat Flux Hot Channel Factor ($F_Q(Z)$ (RAOC-W(Z) Methodology)," and TS 3.2.1C, "Heat Flux Hot Channel Factor ($F_Q(Z)$ (CAOC-W(Z) Methodology)" in NUREG-1431 may not be sufficient to assure that the peaking factor that is assumed in the licensing basis analysis is maintained under all conditions within the surveillance interval of TS SR 3.2.1.2. It also states that this issue applies to plants that have implemented the $F_Q(Z)$ surveillance methodology identified in WCAP-10217-A (Reference 4). Westinghouse recommended that additional actions be performed as part of each $F_Q(Z)$ surveillance and that they be administratively implemented in accordance with U.S. Nuclear Regulatory Commission (NRC) Administrative Letter 98-10. These additional actions will assure that the margin to the TS, $F_Q(Z)$, limiting condition for operation (LCO) limit will always be conservatively calculated. The CNP adopted methodology for $F_Q(Z)$ surveillance is contained within WCAP-10217-A; therefore, TS 3.2.1C of NUREG-1431 as discussed in NSAL-15-1 is applicable to both CNP Unit 1 and Unit 2.

2.4 Description of the Proposed Change

This proposal would make the following changes to SR 3.2.1.2:

Minor editorial changes, changing from lower case("z") to upper case ("Z")

Add the words "*or maximum over Z [$F_Q^C(Z)$*W(Z)/K(Z)]*" and "*or if $F_Q^W(Z)$ is expected to increase prior to the next evaluation of $F_Q^C(Z)$*" to Note 2.

Add the words "*and maximum over Z [$F_Q^C(Z)$*W(Z)/K(Z)] have*" to Note 2 Item b.

Add the words "*For this evaluation $F_Q^W(Z)$ is expected to increase if: max [$F_Q^C(Z, B_n)$*W(Z,B_{n+1})/K(Z)] > max [$F_Q^C(Z, B_n)$*W(Z, B_n)/K(Z)]; Where B_n is the burnup when the Surveillance is performed, and B_{n+1} is the burnup when the next Surveillance is performed.*" at the end of Note 2.

Enclosures 3 and 4 to this letter provide existing Unit 1 and Unit 2 TS pages, respectively, marked up to show the proposed changes. Deleted text is marked thru and new text is underlined. Enclosures 5 and 6 to this letter provide Unit 1 and Unit 2 TS Bases pages, respectively, marked up to reflect the TS change. The TS Bases pages are provided for information purposes only. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the TS 5.5.12, "Technical Specifications Bases Control Program." New clean Unit 1 and Unit 2 TS pages, with proposed changes incorporated, will be provided to the U. S. NRC Licensing Project Manager when requested.

3.0 TECHNICAL EVALUATION

3.1 Technical Assessment:

CNP's core monitoring tools calculate core power distributions including the height dependent heat flux hot channel factor, $F_Q(Z)$. TS 3.2.1 ensures that $F_Q(Z)$ is maintained within the limits assumed in the plant safety analysis. Compliance with the TS LCO is demonstrated by measuring the steady-state peak power density at each axial elevation and verifying that both the steady-state $F_Q(Z)$, $F_Q^C(Z)$, and the transient $F_Q(Z)$, $F_Q^W(Z)$, are within the $F_Q(Z)$ limits. The $F_Q^W(Z)$ values are derived by applying a pre-calculated allowance factor, W(Z), to the $F_Q^C(Z)$ values. The W(Z) factor adjusts for the maximum $F_Q(Z)$ increase at each axial location expected during normal plant operation to the $F_Q^C(Z)$) values. The W(Z) values are provided in the Core Operating Limits Report (COLR).

In February of 2015, Westinghouse issued Nuclear Safety Advisory Letter NSAL-15-1, "Heat Flux Hot Channel Factor Technical Specification Surveillance." (Reference 1) This NSAL-15-1 stated that one aspect of TS SR 3.2.1.2 of TS 3.2.1B, "Heat Flux Hot Channel Factor ($F_Q(Z)$ (RAOC\-W(Z) Methodology)," and TS 3.2.1C, "Heat Flux Hot Channel Factor ($F_Q(Z)$ (CAOC-W(Z) Methodology," in NUREG-1431 may not be sufficient to assure that the peaking factor that is assumed in the licensing basis analysis is maintained under all conditions within the surveillance interval of TS SR 3.2.1.2. It also states that this issue applies to plants that have implemented the $F_Q(Z)$ surveillance methodology identified in WCAP-10217-A (Reference 4). Westinghouse recommended that additional actions be performed as part of each $F_Q(Z)$ surveillance and that they be administratively implemented in accordance with U.S. Nuclear Regulatory Commission (NRC) Administrative Letter 98-10. These additional actions will assure that the margin to $F_Q(Z)$ LCO limit will always be conservatively calculated. The CNP adopted methodology for $F_Q(Z)$ surveillance is contained within WCAP-10217-A; therefore, TS 3.2.1C of NUREG-1431 as discussed in NSAL-15-1 is applicable to both CNP Unit 1 and Unit 2.

The Nuclear Safety Advisory Letter NSAL-15-1 notes that the existing TS requires that a penalty factor be applied to the transient $F_Q(Z)$ when compared to the $F_Q(Z)$ limit when two successive flux maps indicate that the equilibrium $F_Q(Z)$ margin to limit has decreased. It also notes that the need to apply a penalty factor based solely on the equilibrium $F_Q(Z)$ results from two successive flux maps may not be sufficiently conservative. Therefore, Westinghouse recommended that two additional checks be performed. One is to check for an increase in the transient $F_Q(Z)$ between two successive flux maps and the second is to check for a predicted increase in the transient $F_Q(Z)$ at the next surveillance. These two recommended additional checks were administratively implemented at CNP in accordance with NRC Administrative Letter 98-10 and are the subject of implementation under this License Amendment Request.

As recommended in NSAL-15-1 (Reference 1), CNP proposes to additionally apply the penalty factor of 1.02 or a factor specified in the COLR, whichever is greater, to the transient $F_Q(Z)$ calculation if:

1. The transient $F_Q(Z)$ has increased since the previous $F_Q(Z)$ surveillance, or

2. The transient $F_Q(Z)$ is expected to increase at the next $F_Q(Z)$ surveillance.

3.2 Affected Surveillance Requirements:

Unit 1 and Unit 2 TS SR 3.2.1.2 is the only Surveillance affected by this proposed change. The surveillance Frequency is controlled in accordance with TS 5.5.17, "Surveillance Frequency Control Program."

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Regulatory Requirements

The General Design Criteria (GDC) listed in 10 CFR 50 Appendix A were published after the CNP construction permits were issued, and the GDC were not included in CNP's original licensing basis.

As described in UFSAR, Section 1.4, the Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the CNP design. The following PSDC are relevant to the proposed amendment:

PSDC CRITERION 6 Reactor Core Design

> *The reactor core with its related controls and protection systems shall be designed to function throughout its design lifetime without exceeding acceptable fuel damage limits which have been stipulated and justified. The core and related auxiliary system designs shall provide this integrity under all expected conditions of normal operation with appropriate margins for uncertainties and for specified transient situations which can be anticipated.*

PSDC CRITERION 7 Suppression of Power Oscillations

> *The design of the reactor core with its related controls and protection systems shall ensure that power oscillations, [sic] the magnitude of which could cause damage in excess of acceptable fuel damage limits, are not possible or can be readily suppressed.*

PSDC CRITERION 13 Fission Process Monitors and Controls

> *Means shall be provided for monitoring or otherwise measuring and maintaining control over the fission process throughout core life under all conditions that can reasonably be anticipated to cause variations in reactivity of the core.*

The proposed changes are consistent with the above regulatory requirements and criteria. Therefore, the proposed changes will assure safe operation by continuing to meet applicable regulations and requirements.

4.2 Precedents

The proposed changes to the CNP Unit 1 and Unit 2 TS are fundamentally the same as those approved in the following Safety Evaluations. These precedents also address additional issues associated with NSAL-09-5 that are not applicable to CNP. NSAL-15-1, Rev. 0 issues were addressed using Relaxed Axial Offset Control (RAOC) methodology.

1. Letter from V. Sreenivas, U. S. Nuclear Regulatory Commission (NRC), to David A. Heacock (Virginia Electric and Power Company), "North Anna Power Station, Unit Nos. 1 and 2 – Issuance of Amendments to Revise Technical Specifications to Address Issues Identified in Westinghouse NSAL-09-5, Revision 1, and NSAL-15-1, Revision 0 (CAC Nos. MF7186 and MF7187)," dated October 17, 2016, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML16252A478).

2. Letter from Richard V. Guzman, NRC, to David A. Heacock (Dominion Nuclear), "Millstone Power Station, Unit No. 3 – Issuance of Amendment Adopting Dominion Core Design and Safety Analysis Methods and Addressing the Issues Identified in Three Westinghouse Communication Documents (CAC No. MF6251)," dated July 28, 2016, (ADAMS Accession Number ML16131A728).

4.3 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, Facility Operating Licenses No. DPR-58 and DPR-74, respectively, proposes to modify Technical Specification (TS) Section 3.2.1, "Heat Flux Hot Channel Factor $F_Q(Z)$)," to address issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL) NSAL-15-1, Rev. 0, by defining TS surveillance requirements for transient $F_Q(Z)$ and corresponding actions with which to apply an appropriate penalty factor to measured results.

I&M has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92(c), "Issuance of amendment," as discussed below:

1. *Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?*

   Response: No.

   The proposed amendment to add an additional surveillance requirement, to apply the penalty factor of 1.02 or a factor specified in the COLR, whichever is greater, to the transient $F_Q(Z)$ calculation, ensures that the assumptions and inputs to the safety analyses remain valid and does not result in actions that would increase the probability or consequences of any accident previously evaluated.

The design of the protection systems will be unaffected. The reactor protection system and engineered safety feature actuation system will continue to function in a manner consistent with the plant design basis. All design, material and construction standards that were applicable prior to the request are maintained.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?*

Response: No.

Operation in accordance with the revised TS and its limits precludes new challenges to systems or structures that might introduce a new type of accident. All design and performance criteria will continue to be met and no new single failure mechanisms will be created. The proposed change for resolution of Westinghouse NSAL-15-1 does not involve the alteration of plant equipment or introduce unique operational modes or accident precursors. Therefore it does not create the potential for a different kind of accident.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *Does the proposed amendment involve a significant reduction in a margin of safety?*

Response: No.

Operation in accordance with the revised TS and its limits preserves the margins assumed in the safety analyses. This ensures that all design and performance criteria associated with the safety analysis will continue to be met and that the margin of safety is not affected.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, I&M concludes that the proposed amendments do not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

I&M has evaluated the proposed amendments for environmental considerations. The review has resulted in the determination that the proposed amendments would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20 or would change an inspection or surveillance requirement. However, the proposed amendments do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendments meet the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendments.

6.0 REFERENCES

1. Westinghouse Nuclear Safety Advisory Letter, NSAL-15-1, Rev. 0, "Heat Flux Hot Channel Factor Technical Specification Surveillance," February 3, 2015.

2. NUREG-1431, Revision 4, Volumes 1 and 2, "Standard Technical Specifications - Westinghouse Plants," April 2012.

3. NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," December 29, 1998.

4. WCAP-10217-A, Revision 1A, "Relaxation of Constant Axial Offset Control/ F_Q Surveillance Technical Specification," February 1994. (WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control/ F_Q Surveillance Technical Specification," February 1994, is the Proprietary version of WCAP-10217-A, Revision 1A.)

ENCLOSURE 3 TO AEP-NRC-2019-05

Donald C. Cook Nuclear Plant Unit 1 Technical Specification Page Marked To Show Proposed Changes

Page 3.2.1-4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 ----------NOTES---------- 1. Not required to be performed during power escalation at the beginning of each cycle until 24 hours after equilibrium conditions at a power level for extended operation are achieved. 2. If measurements indicate that the maximum over Z~~z~~ ($F_Q^C(Z)/K(Z)$) or maximum over Z [$F_Q^C(Z)*W(Z)/K(Z)$] has increased since the previous evaluation of $F_Q^C(Z)$ or if $F_Q^W(Z)$ is expected to increase prior to the next evaluation of $F_Q^C(Z)$ either: a. Increase $F_Q^W(Z)$ by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits; or b. Repeat SR 3.2.1.2 once per 7 EFPD until either a. above is met or two successive flux maps indicate that the maximum over Z~~z~~ ($F_Q^C(Z)/K(Z)$) and maximum over Z [$F_Q^C(Z)*W(Z)/K(Z)$] have~~has~~ not increased. For this evaluation $F_Q^W(Z)$ is expected to increase if: $\max [F_Q^C(Z, B_n)*W(Z, B_{n+1})/K(Z)] > \max [F_Q^C(Z, B_n)*W(Z, B_n)/K(Z)]$; Where B_n is the burnup when the Surveillance is performed, and B_{n+1} is the burnup when the next Surveillance is performed. ---------- Verify $F_Q^W(Z)$ is within limit.	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND In accordance with the Surveillance Frequency Control Program

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Donald C. Cook Nuclear Plant Unit 2 Technical Specification Page Marked To Show Proposed Changes

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 ----------NOTES---------- 1. Not required to be performed during power escalation at the beginning of each cycle until 24 hours after equilibrium conditions at a power level for extended operation are achieved. 2. If measurements indicate that the maximum over Z~~=~~ ($F_Q^C(Z)/K(Z)$) or maximum over Z [$F_Q^C(Z)*W(Z)/K(Z)$] has increased since the previous evaluation of $F_Q^C(Z)$ or if $F_Q^W(Z)$ is expected to increase prior to the next evaluation of $F_Q^C(Z)$ either: a. Increase $F_Q^W(Z)$ by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits; or b. Repeat SR 3.2.1.2 once per 7 EFPD until either a. above is met or two successive flux maps indicate that the maximum over Z~~=~~ ($F_Q^C(Z)/K(Z)$) and maximum over Z [$F_Q^C(Z)*W(Z)/K(Z)$] have~~has~~ not increased. For this evaluation $F_Q^W(Z)$ is expected to increase if: max [$F_Q^C(Z, B_n)*W(Z, B_{n+1})/K(Z)$] > max [$F_Q^C(Z, B_n)*W(Z, B_n)/K(Z)$]; Where B_n is the burnup when the Surveillance is performed, and B_{n+1} is the burnup when the next Surveillance is performed. ----------	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND
Verify $F_Q^W(Z)$ is within limit.	In accordance with the Surveillance Frequency Control Program

ENCLOSURE 5 TO AEP-NRC-2019-05

Donald C. Cook Nuclear Plant Unit 1 Technical Specification Bases Pages Marked To Show Proposed Changes

(For Information Only)

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.2

The nuclear design process includes calculations performed to determine that the core can be operated within the $F_Q(Z)$ limits. Because flux maps are taken in steady state conditions, the variations in power distribution resulting from normal operational maneuvers are not present in the flux map data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation. The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor, $F_Q^C(Z)$, by W(Z) gives the maximum $F_Q(Z)$ calculated to occur in normal operation, $F_Q^W(Z)$.

The W(Z) data is provided in the COLR for discrete core elevations. Flux map data are typically taken for 30 to 75 core elevations. $F_Q^W(Z)$ evaluations are not applicable for the following axial core regions, measured in percent of core height:

a. Lower core region, from 0% to no more than 10% inclusive; and

b. Upper core region, from no less than 90% to 100% inclusive.

The lower and upper axial core regions are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analyses and because of the difficulty of making a precise measurement in these regions. The regions excluded from the surveillance are identified in the W(Z) table in the COLR.

This Surveillance has been modified by a Note (Note 2) that may require that more frequent Surveillances be performed. An evaluation of the expression below is required to account for any increase to $F_Q^W(Z)$ that may occur and cause the $F_Q(Z)$ limit to be exceeded before the next required $F_Q^C(Z)$ evaluation.

If measurements indicate that the maximum over Z ($F_Q^C(Z)/K(Z)$) has increased since its previous evaluation or that the maximum over Z ($F_Q^C(Z)*W(Z)/K(Z)$) has increased since its previous evaluation or is expected to increase prior to its next evaluation, then it is required to increase $F_Q^W(Z)$ by the greater of 1.02 or an appropriate factor specified in the COLR (Ref. 5) and reverify that $F_Q^W(Z)$ is within its limit; or SR 3.2.1.2 must be repeated once per 7 EFPD until either $F_Q^W(Z)$, increased by the above factor, is within its limit or two successive flux maps indicate that neither the maximum over Z ($F_Q^C(Z)/K(Z)$) nor the maximum over Z ($F_Q^C(Z)*W(Z)/K(Z)$) has increased. These requirements prevent $F_Q(Z)$ from exceeding

its limit without detection. ~~If measurements indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) has increased since the previous evaluation of $F_Q^C(Z)$, it is required to meet the $F_Q(Z)$ limit with the last $F_Q^W(Z)$ increased by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR (Ref. 5) and reverify $F_Q^W(Z)$ is within limits; or SR 3.2.1.2 must be repeated once per 7 EFPD until either $F_Q^W(Z)$ is within the limits or two successive flux maps indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) has not increased.~~

$F_Q(Z)$ is verified at power levels ≥ 10% RTP above the THERMAL POWER of its last verification, 24 hours after achieving equilibrium conditions to ensure that $F_Q(Z)$ is within its limit at higher power levels.

ENCLOSURE 6 TO AEP-NRC-2019-05

Donald C. Cook Nuclear Plant Unit 2 Technical Specification Bases Pages Marked To Show Proposed Changes

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.2

The nuclear design process includes calculations performed to determine that the core can be operated within the $F_Q(Z)$ limits. Because flux maps are taken in steady state conditions, the variations in power distribution resulting from normal operational maneuvers are not present in the flux map data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation. The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor, $F_Q^C(Z)$, by W(Z) gives the maximum $F_Q(Z)$ calculated to occur in normal operation, $F_Q^W(Z)$.

The W(Z) data is provided in the COLR for discrete core elevations. Flux map data are typically taken for 30 to 75 core elevations. $F_Q^W(Z)$ evaluations are not applicable for the following axial core regions, measured in percent of core height:

a. Lower core region, from 0% to no more than 10% inclusive; and

b. Upper core region, from no less than 90% to 100% inclusive.

The lower and upper axial core regions are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analyses and because of the difficulty of making a precise measurement in these regions. The regions excluded from the surveillance are identified in the W(Z) table in the COLR.

This Surveillance has been modified by a Note (Note 2) that may require that more frequent Surveillances be performed. An evaluation of the expression below is required to account for any increase to $F_Q^W(Z)$ that may occur and cause the $F_Q(Z)$ limit to be exceeded before the next required $F_Q^C(Z)$ evaluation.

If measurements indicate that the maximum over Z ($F_Q^C(Z)/K(Z)$) has increased since its previous evaluation or that the maximum over Z ($F_Q^C(Z)*W(Z)/K(Z)$) has increased since its previous evaluation or is expected to increase prior to its next evaluation, then it is required to increase $F_Q^W(Z)$ by the greater of 1.02 or an appropriate factor specified in the COLR (Ref. 5) and reverify that $F_Q^W(Z)$ is within its limit; or SR 3.2.1.2 must be repeated once per 7 EFPD until either $F_Q^W(Z)$, increased by the above factor, is within its limit or two successive flux maps indicate that neither the maximum over Z ($F_Q^C(Z)/K(Z)$) nor the maximum over Z ($F_Q^C(Z)*W(Z)/K(Z)$) has increased. These requirements prevent $F_Q(Z)$ from exceeding

its limit without detection. ~~If measurements indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) has increased since the previous evaluation of $F_Q^C(Z)$, it is required to meet the $F_Q(Z)$ limit with the last $F_Q^W(Z)$ increased by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR (Ref. 5) and reverify $F_Q^W(Z)$ is within limits; or SR 3.2.1.2 must be repeated once per 7 EFPD until either $F_Q^W(Z)$ is within the limits or two successive flux maps indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) has not increased.~~

$F_Q(Z)$ is verified at power levels ≥ 10% RTP above the THERMAL POWER of its last verification, 24 hours after achieving equilibrium conditions to ensure that $F_Q(Z)$ is within its limit at higher power levels.